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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/672,631	09/27/2003	Evgeni Gousev	YOR920030463US1	3431
24299	7590	10/05/2005	EXAMINER	
GEORGE SAI-HALASZ 303 TABER AVENUE PROVIDENCE, RI 02906			GURLEY, LYNNE ANN	
			ART UNIT	PAPER NUMBER
			2812	

DATE MAILED: 10/05/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/672,631

Applicant(s)

GOUSEV ET AL.

Examiner

Lynne A. Gurley

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 15 July 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-23 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-23 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

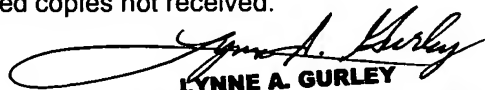
Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.


LYNNE A. GURLEY
PRIMARY PATENT EXAMINER
TC 2800, AU 2812

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.

- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

This Office action is in response to the amendment filed 7/15/05.

Currently, claims 1-23 are pending. Claims 24-30 have been canceled.

Specification

1. The lengthy specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
 2. Ascertaining the differences between the prior art and the claims at issue.
 3. Resolving the level of ordinary skill in the pertinent art.
 4. Considering objective evidence present in the application indicating obviousness or nonobviousness.
4. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various

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claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

5. Claims 1-23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Maagdenberg (US 3,843,398, dated 10/22/94) in view of Matsudaira et al. (4,870,322, dated 9/26/89).

Maagdenberg shows the method as claimed as taking a Germanium substrate and exposing the substrate to both nitrogen and oxygen to form a Germanium oxynitride layer. It is considered inherent that the exposure of the Germanium substrate to both nitrogen and oxygen will incorporate the nitrogen at a first concentration into a surface layer underneath a first surface of the Germanium. Thermal conditions are used. Plasma is disclosed. Columns 2-5, especially, column 2, lines 5-33; column 3, lines 19-60; column 4, lines 10-20; column 5, lines 30-55).

Maagdenberg lacks anticipation only in not teaching that the first concentration of nitrogen in the first surface layer is controlling the growth of the oxynitride layer; thicknesses such as EOT; ion implanting the nitrogen; thermal temperature; energy of implantation; implanting through a screen layer; power and time; concentrations; cleaning the surface of the substrate before incorporating the nitrogen and oxygen and associated claimed parameters.

Matsudaira teaches, in figures 13-19 and corresponding text, incorporating various concentrations of nitrogen and oxygen into Germanium to form Germanium oxynitride (column 17, lines 28-668; column 18, lines 1-68). Although, sputter deposition is the exemplary method

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of formation, Matsudaira shows that the structure can be accomplished by alternate means such as CVD, reactive evaporation, ion plating (column 21, lines 40-43). Matsudaira also teaches that the concentration of the nitrogen and oxygen may be varied in order to tailor the refractive index and the extinction coefficient (k) of the Germanium material as well as the resistivity and other parameters (column 17, lines 55-68; column 18, lines 1-40).

It would have been obvious to one of ordinary skill in the art to have had the first concentration of nitrogen in the first surface layer control the growth of the oxynitride layer; to have had the claimed thicknesses such as EOT; to have ion implanted the nitrogen; to have had the claimed thermal temperature, energy of implantation, implantation through a screen layer, power and time, concentrations and cleaning the surface of the substrate before incorporating the nitrogen and oxygen and associated claimed parameters, in the method of Maagdenberg, with the motivation that Matsudaira teaches that the variation in concentration of nitrogen and oxygen controls the growth of the oxynitride layer and the associated properties of the layer; and, with the motivation that the parameters of formation of the layer such as temperature, time power, implantation, etc. would be obvious to one of ordinary skill in the art since the prior art of record acknowledges implantation, and since the parameters may be tailored to the desired results of the final device structure.

Response to Arguments

6. Applicant's arguments filed 7/15/05 have been fully considered but they are not persuasive. In response to Applicant's remarks, pages 7-8, Maagdenberg shows the method substantially as discussed in the previous paragraphs. The wafer is of a Ge-based material which has a first surface. Since the references teach different combinations of nitride and oxide layers, the Examiner takes the position that a two step process is disclosed wherein the nitrogen is incorporated, followed by the oxygen exposure.

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Conclusion

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. See the previously submitted PTO Form 892.

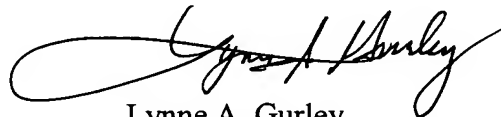
8. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Lynne A. Gurley whose telephone number is 571-272-1670. The examiner can normally be reached on M-F 7:30-4:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Lebentritt can be reached on 571-272-1873. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Lynne A. Gurley
Primary Patent Examiner
Art Unit 2812

LAG
October 3, 2005